

299-E17-12 (A4730) Log Data Report

Borehole Information:

Borehole: 299-E17-12 (A4730)		Site: 216-A-45 Crib		
Coordinates (WA St Plane)		GWL ¹ (ft): 325.05	GWL Date: 10/12/06	
North (m) 135125.906	East (m) 574905.372	Drill Date 03/86	TOC Elevation 725.37 ft	Total Depth (ft) 340

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel	2.7	6 5/8	6 1/8	1/4	2.7	340
Steel	0	unknown	8	0.322	0	200

Borehole Notes:

The logging engineer measured the casing diameter of the 6-in. casing using a caliper and steel tape. The 8-in. casing was not observed at the ground surface and could not be measured. The thickness is assumed from published data for ASTM 8-in. casing. A "Well Completion Summary As-Built" indicates a surface seal of grout from 0 to 20 ft. In addition, the annular space between the 6- and 8-in. casings was grouted from 0 to 200 ft. Logging data acquisition is referenced to the TOC.

Logging Equipment Information:

Logging System:	Gamma 4E	Type:	SGLS (70%) SN: 34-TP40587A
Effective Calibration Date:	05/08/06	Calibration Reference:	DOE-EM/GJ1199-2006

Logging System:	Gamma 4H	Type:	NMLS SN: H310700352
Effective Calibration Date:	03/06/06	Calibration Reference:	DOE-EM/GJ1154-2006

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4 Repeat	
Date	10/10/06	10/11/06	10/12/06	10/12/06	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	3.0	32.0	194.0	291.0	
Finish Depth (ft)	33.0	195.0	324.0	324.0	
Count Time (sec)	100	100	100	100	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
ft/min	N/A ²	N/A	N/A	N/A	
Pre-Verification	DED61CAB	DED71CAB	DED81CAB	DED81CAB	

Log Run	1	2	3	4 Repeat	
Start File	DED61000	DED71000	DED81000	DED81131	
Finish File	DED61030	DED71163	DED71130	DED71164	
Post-Verification	DED61CAA	DED71CAA	DED81CAA	DED81CAA	
Depth Return Error (in.)	0	- 1	N/A	- 3	
Comments	No fine-gain adjustment.	Fine-gain adjustment after file -112.	Fine-gain adjustment after files -059 and -095.	No fine-gain adjustment.	

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	5	6	7 Repeat		
Date	10/13/06	10/13/06	10/13/06		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	190.0	274.0	291.0		
Finish Depth (ft)	275.0	324.0	324.0		
Count Time (sec)	15	15	15		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
Sample Interval (ft)	0.25	0.25	0.25		
ft/min	1.0	1.0	1.0		
Pre-Verification	DH222CAB	DH222CAB	DH222CAB		
Start File	DH222000	DH222341	DH222542		
Finish File	DH222340	DH222541	DH222674		
Post-Verification	DH222CAA	DH222CAA	DH222CAA		
Depth Return Error (in.)	N/A	N/A	- 1		
Comments	None	None	None		

Logging Operation Notes:

Logging was conducted with a centralizer on each sonde and measurements are referenced to top of casing. Moisture measurements were acquired below the double cased interval from 200 to 324 ft.

Analysis Notes:

Analyst:	Henwood	Date:	10/31/06	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging systems were performed before and after the day's data acquisition. The acceptance criteria were met for the SGLS were met. The NMLS failed the verification criteria for the post verification measurement.

A combined casing correction for a 0.572-in. thick casing ($0.322 + 0.25$ for the 8- and 6-in. casing, respectively) was applied to the SGLS data. NMLS data were corrected for an 8-in. borehole.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G4EMay06.xls using an efficiency function and corrections for casing and dead time as determined from annual calibrations. The NMLS count rate data were converted to percent volumetric moisture.

Results and Interpretations:

¹³⁷Cs was the only manmade radionuclide detected. However, these detections are statistical fluctuations and are not considered valid. Caution should be used when interpreting data from 0 to 200 ft where double casing and grout influence the measurements.

Moisture data indicate some variability.

The SGLS and NMLS repeat logs show good repeatability.

List of Log Plots:

Depth Reference is top of casing

Depth Scale - 20 ft/inch except for repeat logs

Man-made Radionuclides (3 pages)

Natural Gamma Logs (3 pages)

Combination Plot (3 pages)

Combination Plot (0-360 ft)

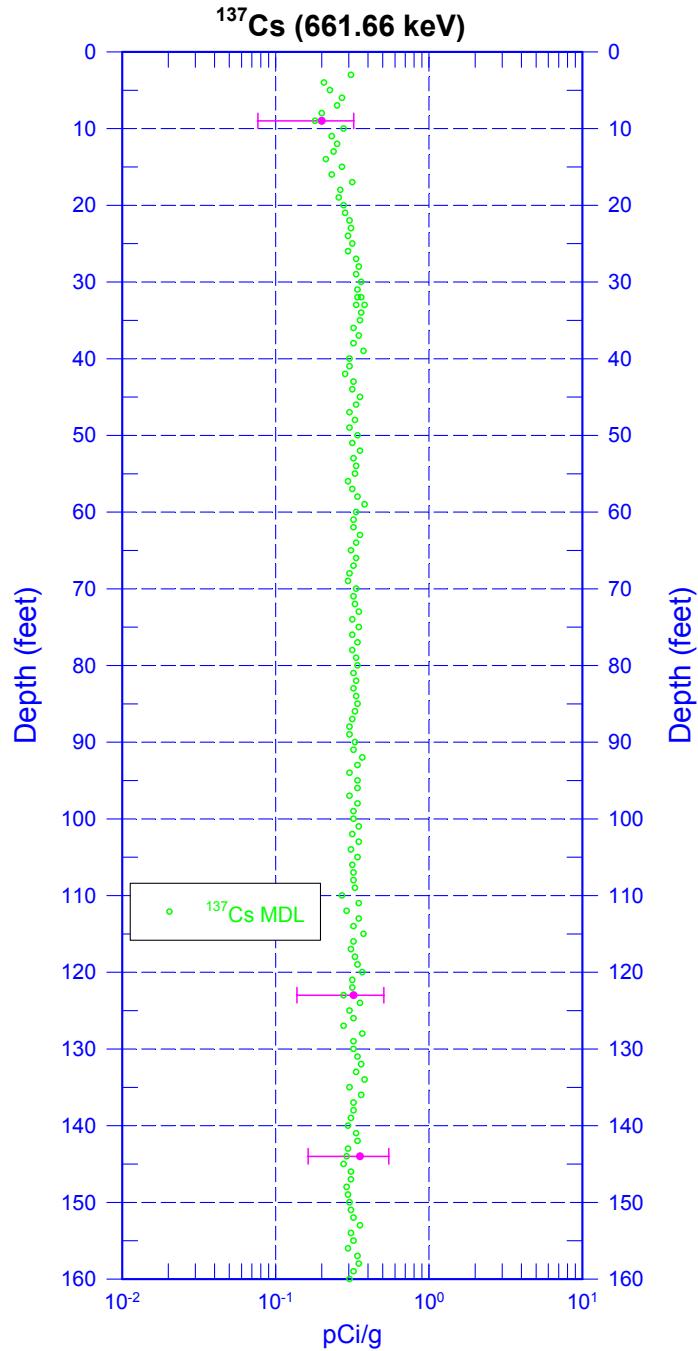
Total Gamma, Dead Time, & Moisture (3 pages)

Repeat of Natural Gamma Logs

Repeat of Total Gamma, Dead Time, & Moisture

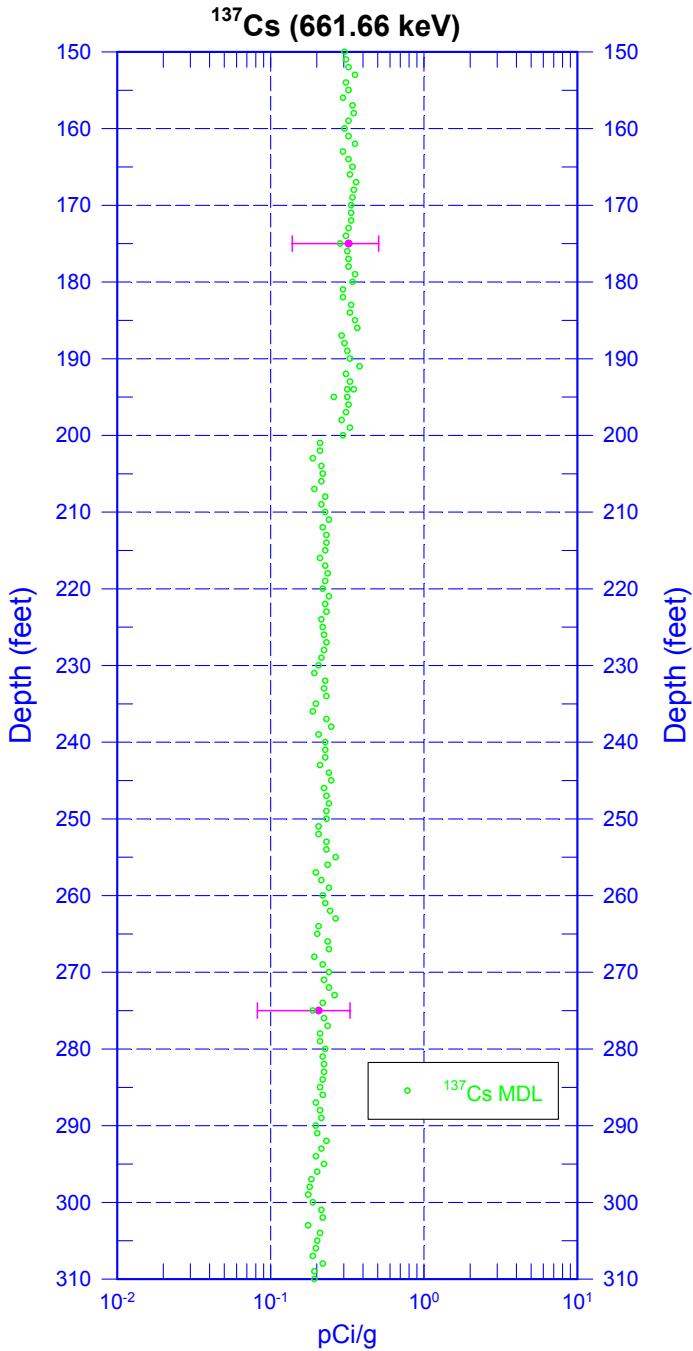
¹ GWL – groundwater level

299-E17-12 (A4730) Manmade Radionuclides



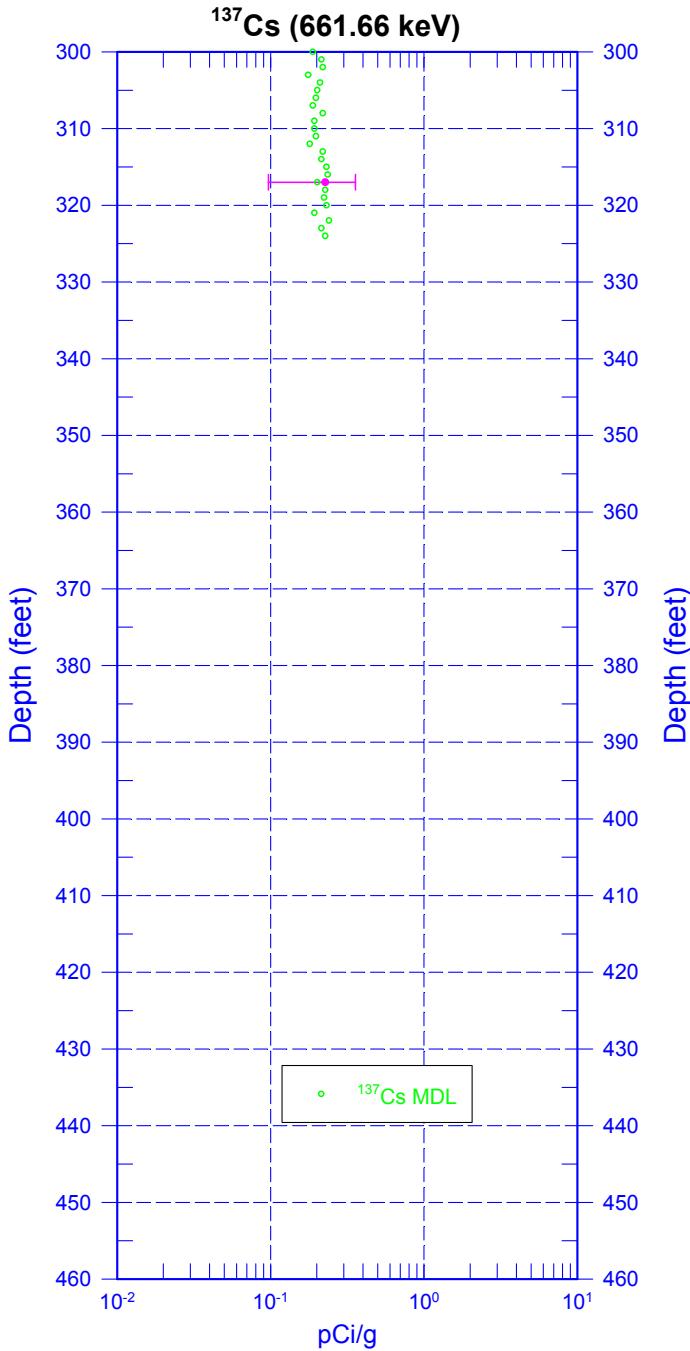
Zero Reference - Top of Casing

299-E17-12 (A4730) Manmade Radionuclides



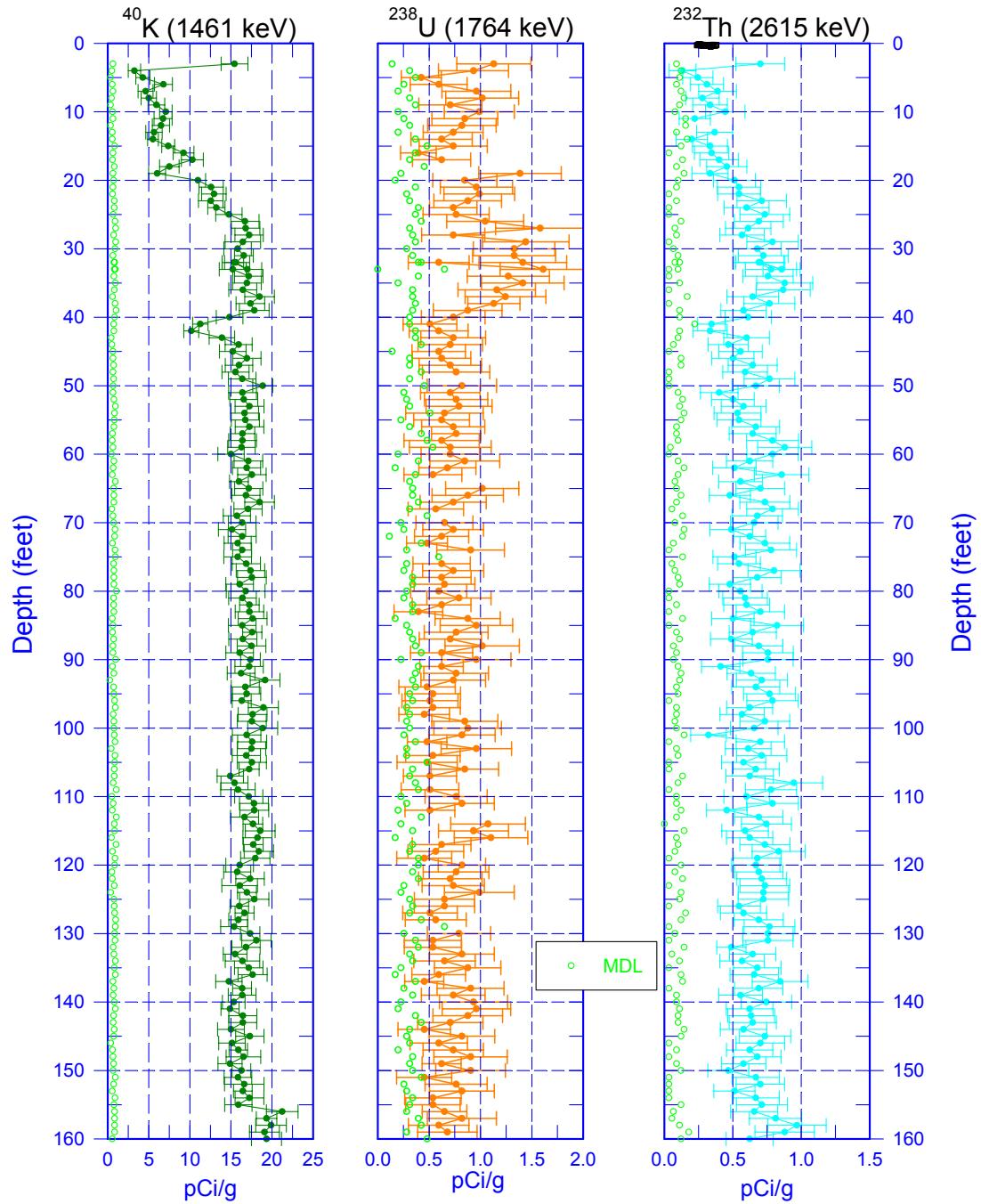
Zero Reference - Top of Casing

299-E17-12 (A4730)
Manmade Radionuclides



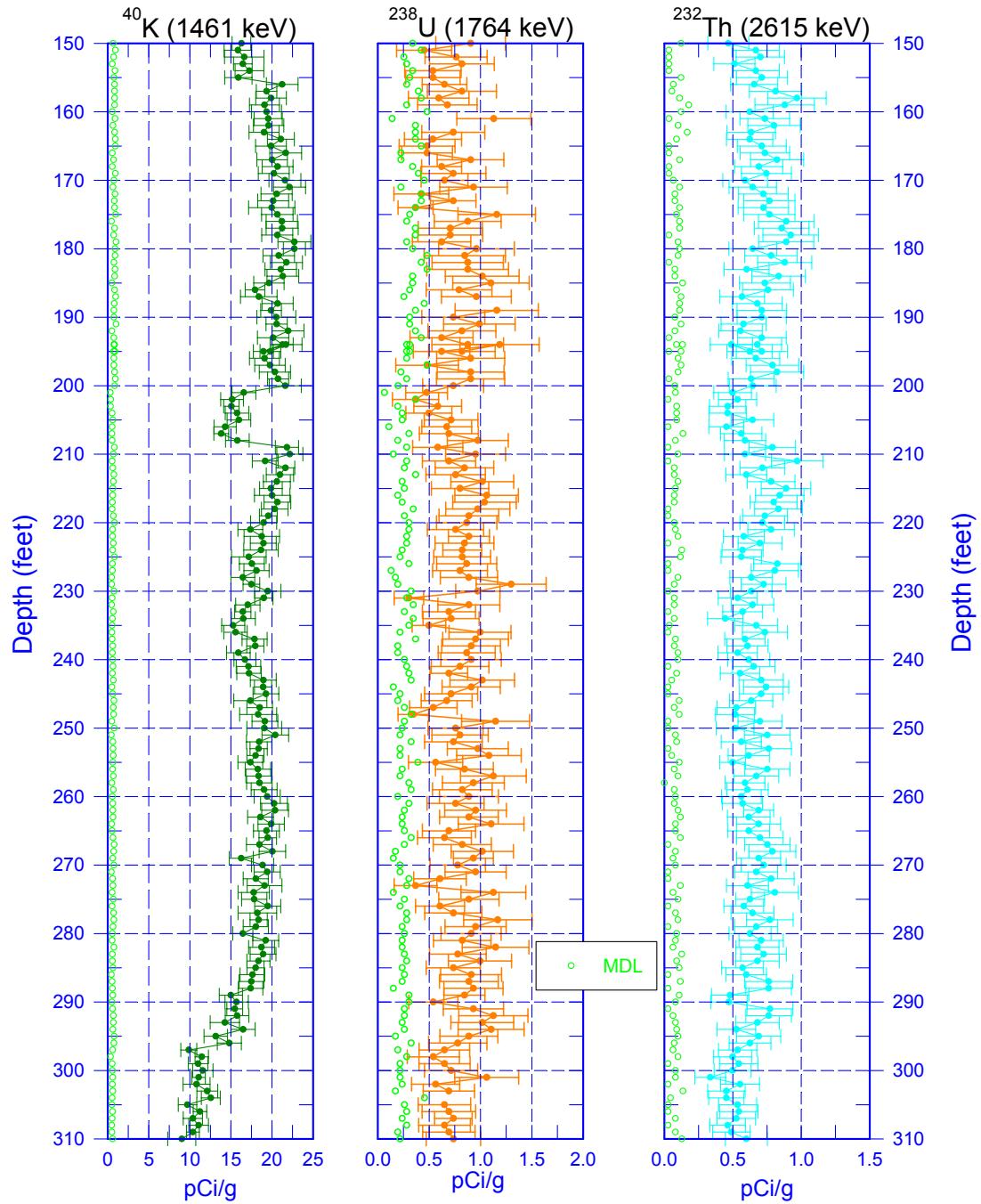
Zero Reference - Top of Casing

299-E17-12 (A4730) Natural Gamma Logs



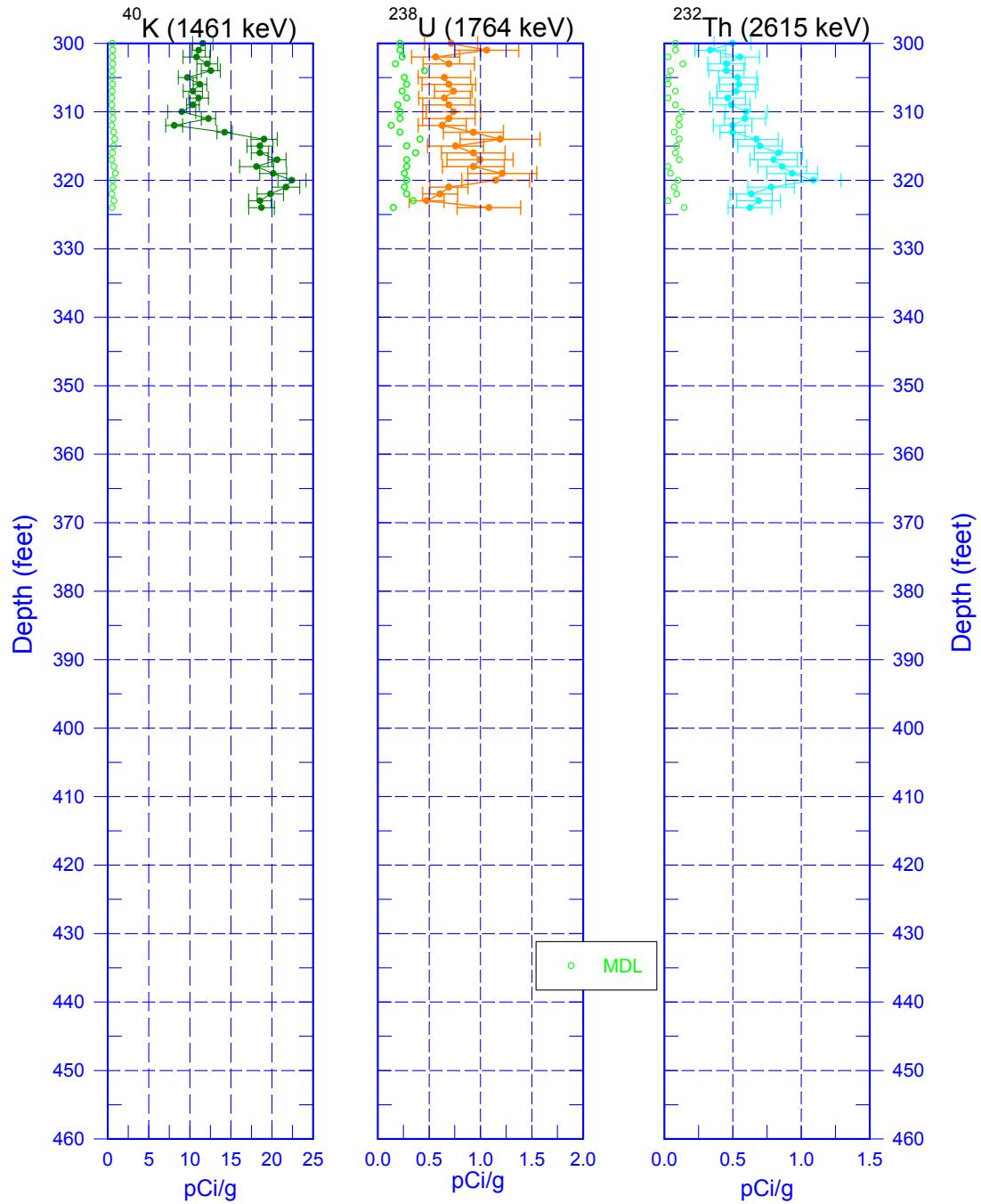
Zero Reference = Top of Casing

299-E17-12 (A4730) Natural Gamma Logs



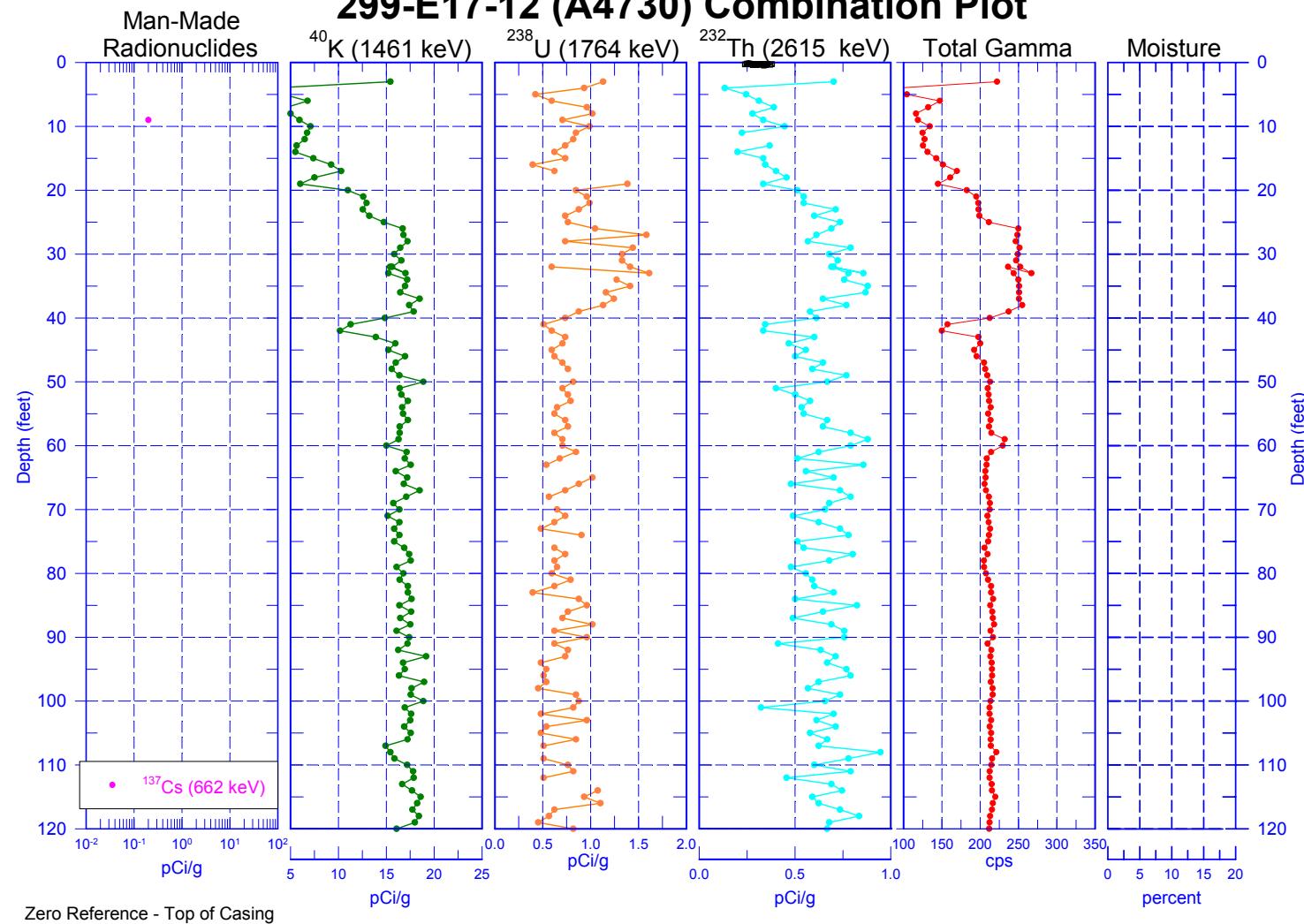
Zero Reference = Top of Casing

299-E17-12 (A4730) Natural Gamma Logs

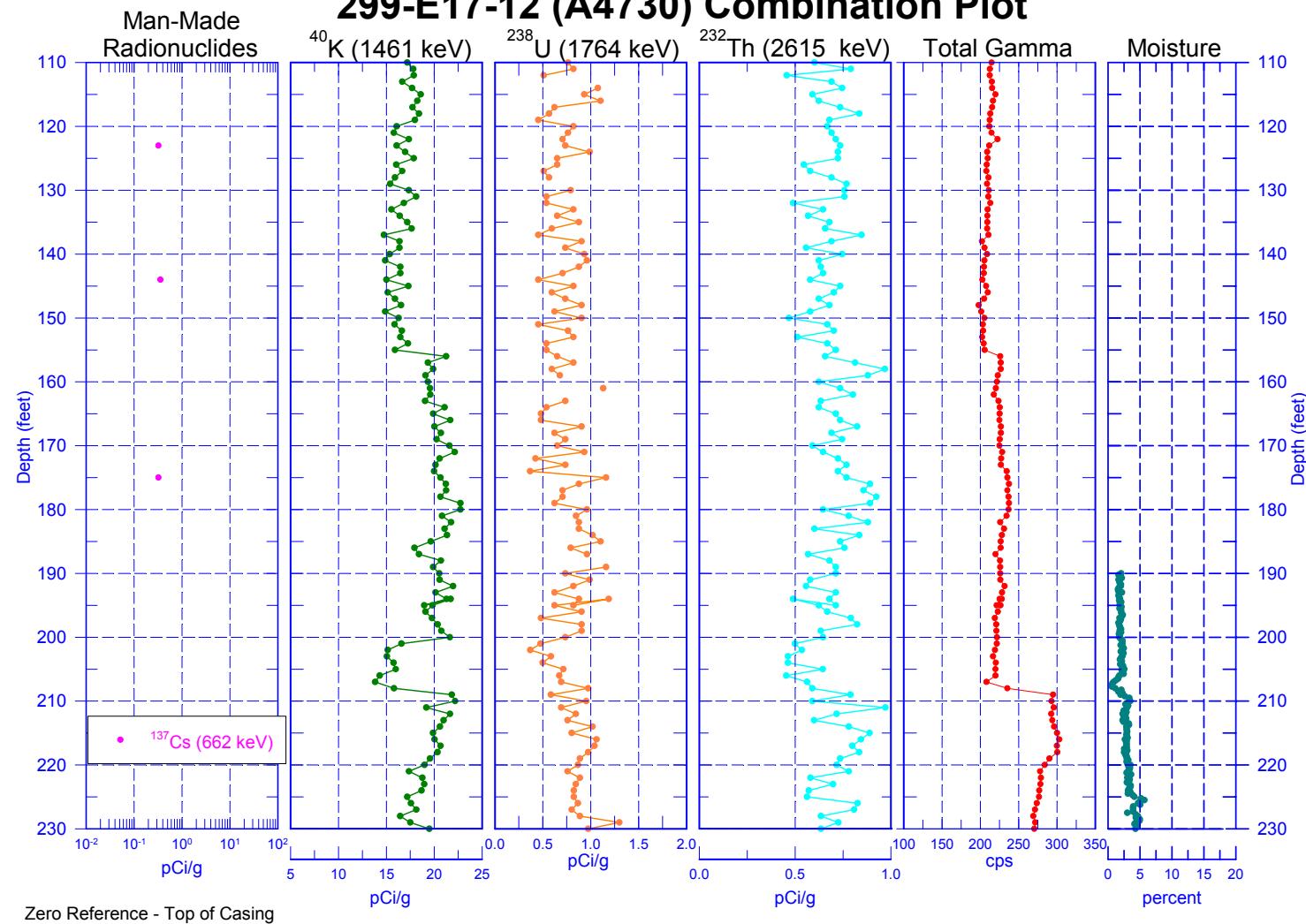


Zero Reference = Top of Casing

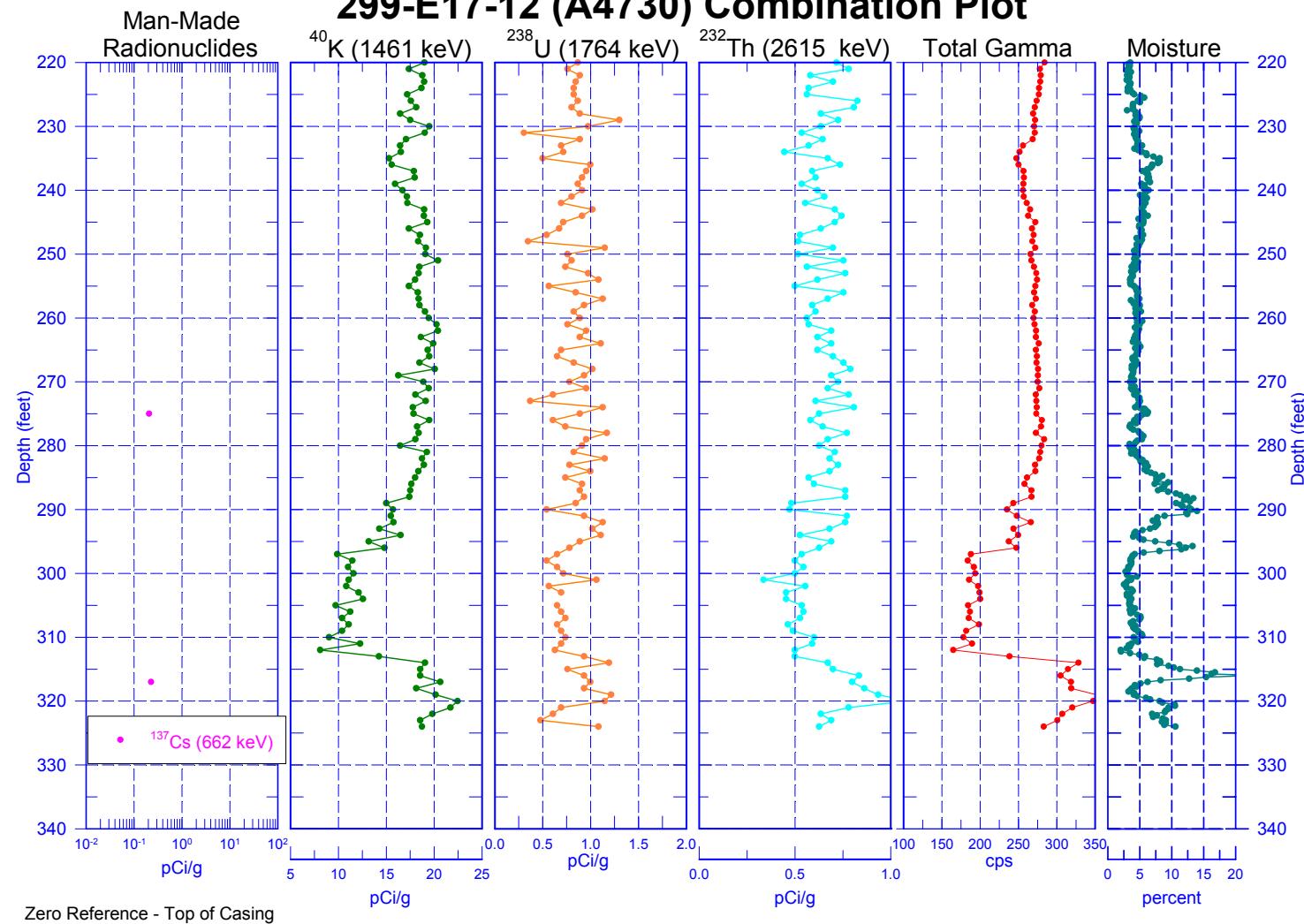
299-E17-12 (A4730) Combination Plot



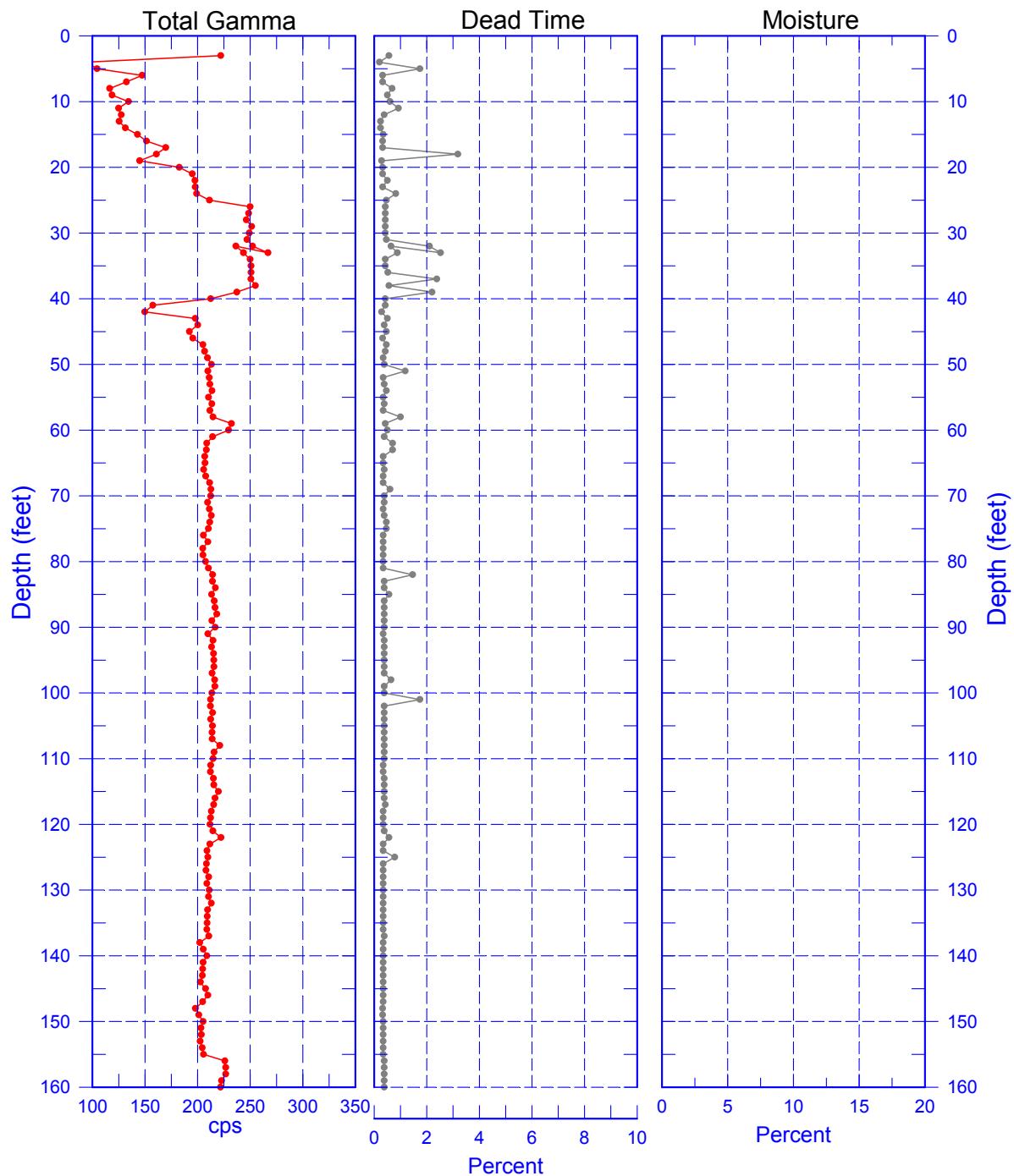
299-E17-12 (A4730) Combination Plot



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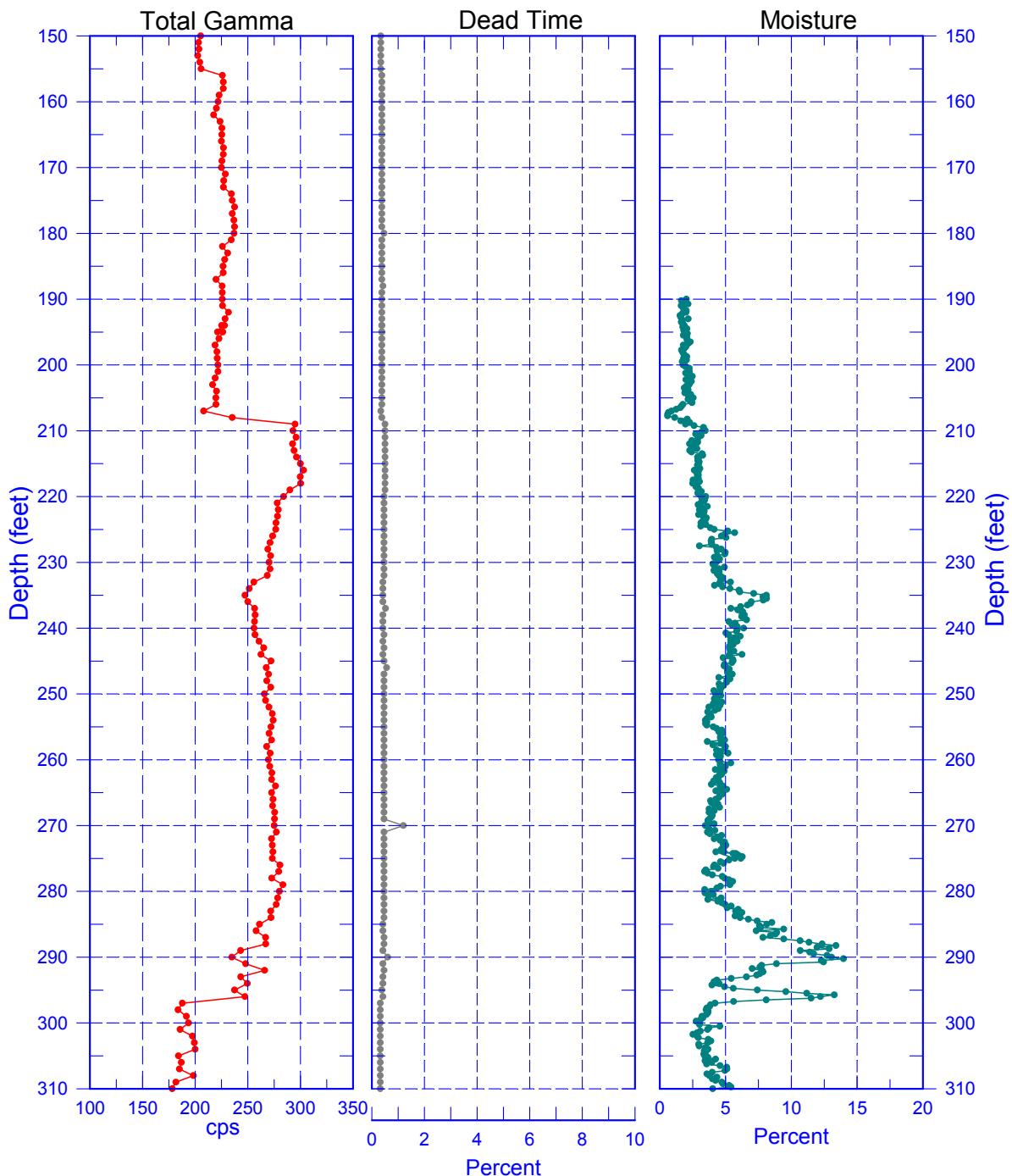


299-E17-12 (A4730)
Total Gamma, Dead Time & Moisture



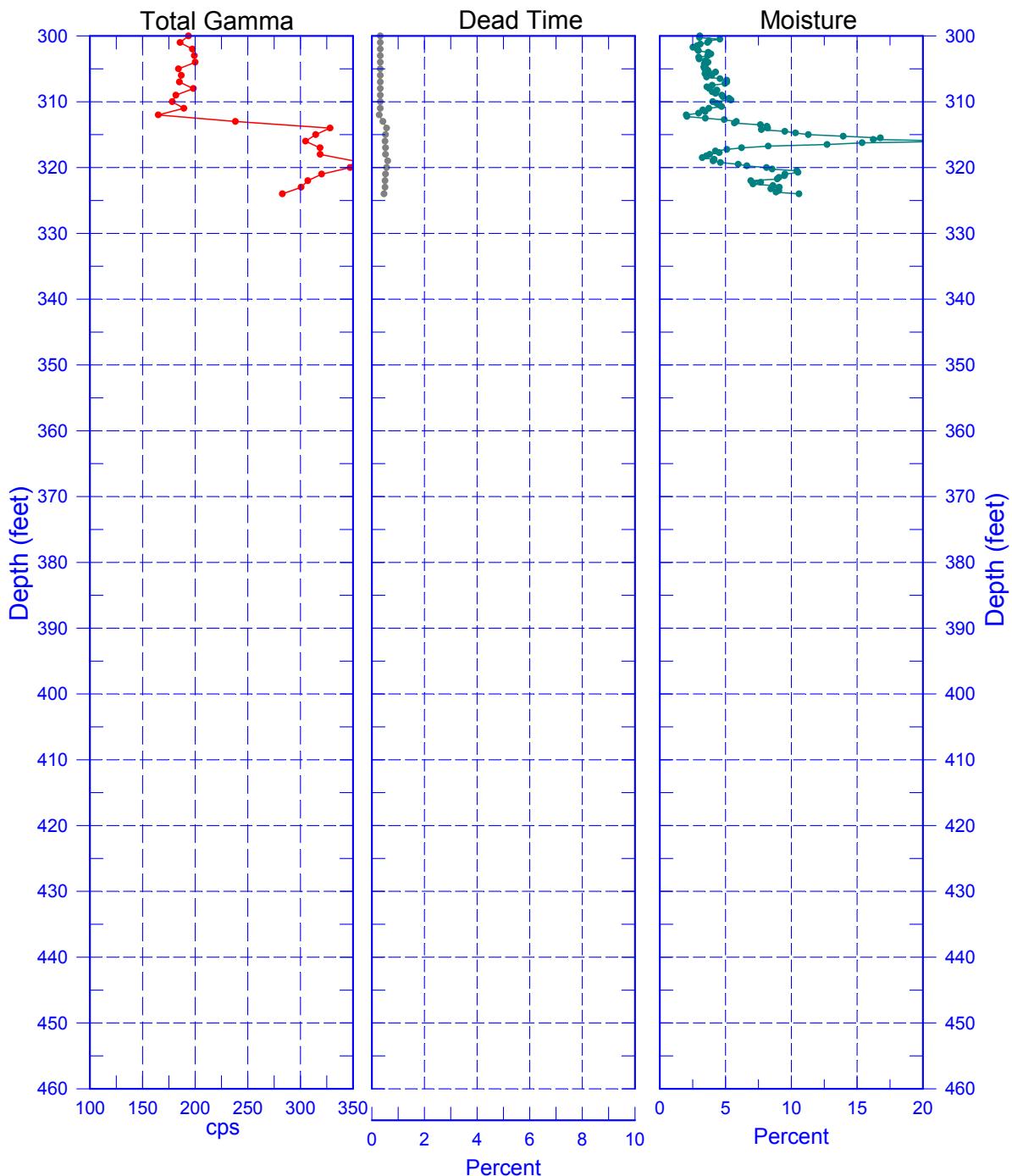
Reference - Top of Casing

299-E17-12 (A4730)
Total Gamma, Dead Time & Moisture



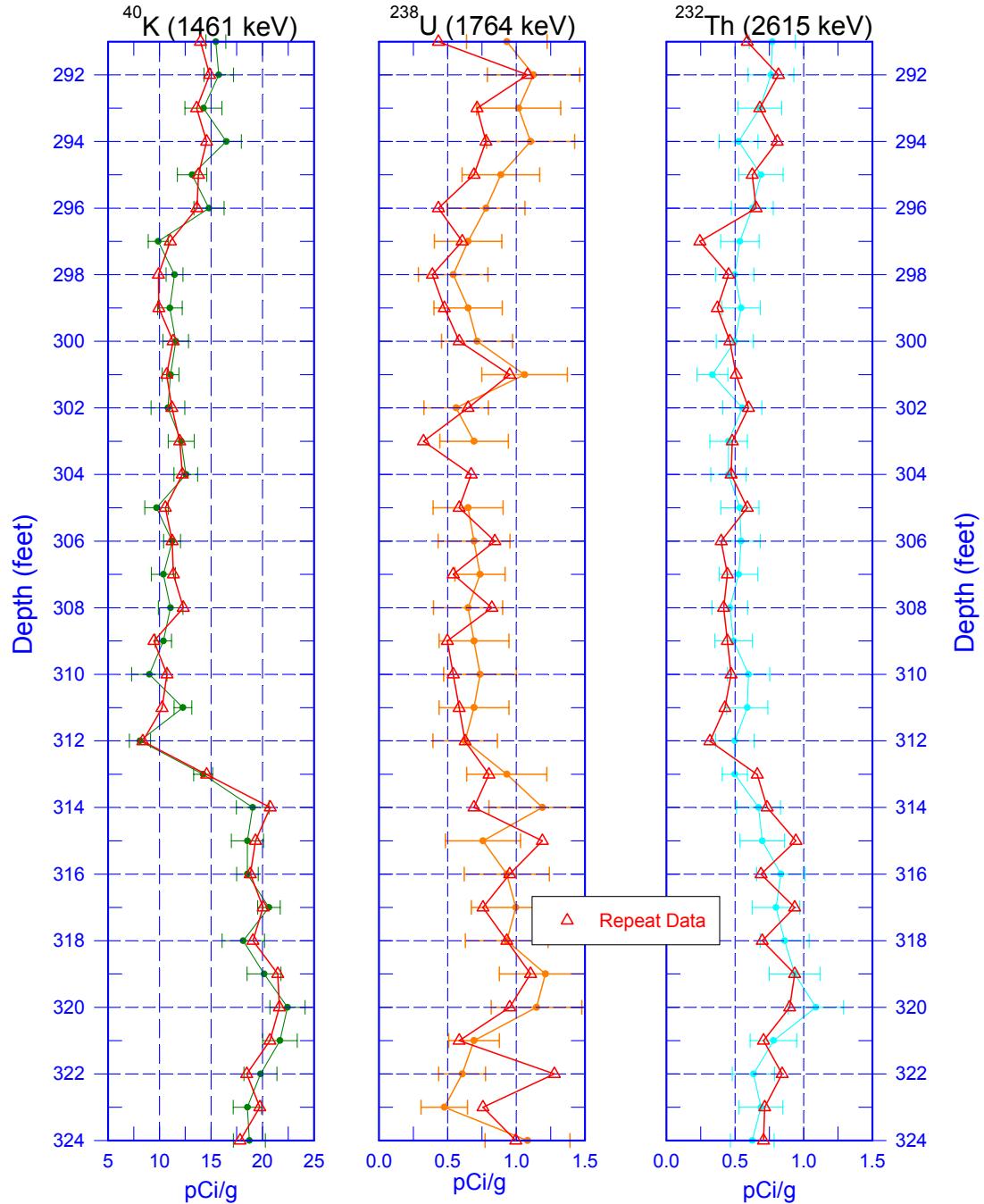
Reference - Top of Casing

299-E17-12 (A4730)
Total Gamma, Dead Time & Moisture



Reference - Top of Casing

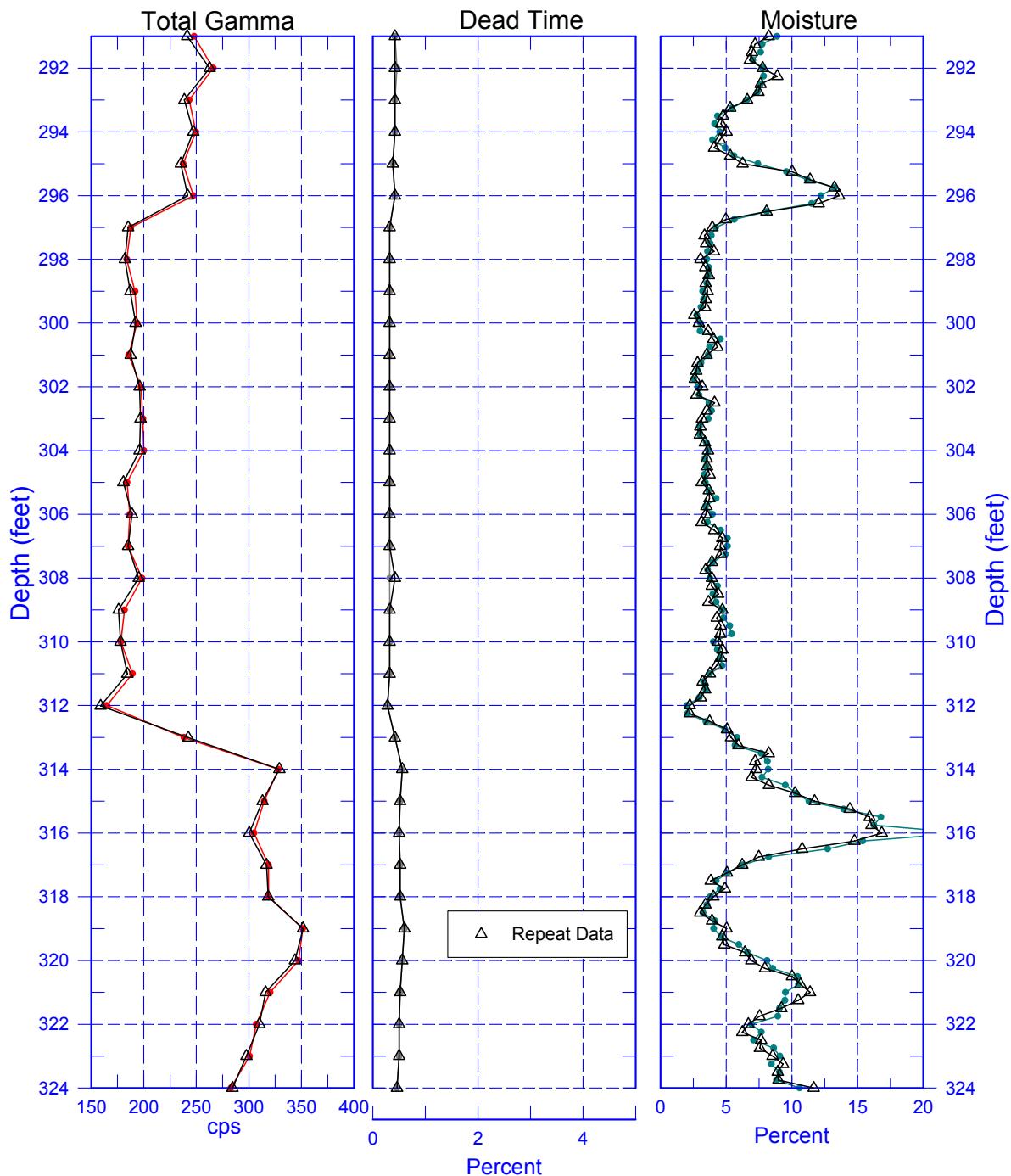
299-W15-82 (A7383) Repeat of Natural Gamma Logs



Zero Reference = Top of Casing

299-E17-12 (A4730)

Repeat of Total Gamma, Dead Time & Moisture



Reference - Top of Casing